

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

REC'D 21 SEP 2005

**PCT** WIPO PCT

To:  
MARK C. COMTOIS  
1667 K STREET, N.W.  
SUITE 700  
WASHINGTON, DC 20006

## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference <b>GRA26 028</b>		Date of mailing (day/month/year) <b>19 SEP 2005</b>
FOR FURTHER ACTION See paragraph 2 below		
International application No. <b>PCT/US05/16453</b>	International filing date (day/month/year) <b>11 May 2005 (11.05.2005)</b>	Priority date (day/month/year) <b>12 May 2004 (12.05.2004)</b>
International Patent Classification (IPC) or both national classification and IPC <b>IPC(7): H04B 7/15 and US Cl.: 455/11.1</b>		
Applicant <b>ANDREW CORPORATION</b>		

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US  
Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
Facsimile No. (703) 305-3230

Authorized officer  
Edan Orgad  
Telephone No. 571-272-7884

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US05/16453

**Box No. I Basis of this opinion**

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ in written format

☐ in computer readable form

c. time of filing/furnishing

☐ contained in international application as filed.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
PCT/US05/16453

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Claims 1-13, 19-34 YES  
Claims 14, 15 and 17 NO

Inventive step (IS)

Claims 1-13, 19-34 YES  
Claims 14-18 NO

Industrial applicability (IA)

Claims 1-34 YES  
Claims NONE NO

2. Citations and explanations:

Please See Continuation Sheet

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
PCT/US05/16453

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

V. 2. Citations and Explanations:

Claims 14, 15 and 17 lack novelty under PCT Article 33(2) as being anticipated by Weissman (US 2002/0061763).

Regarding claim 14, Weissman teaches a communication system including a first node, a second node, and a repeater, wherein the first node receives a first signal from the second node either directly or via the repeater, a method of applying a known distortion to a signal to enable a determination of a signal received by the first node is received directly from the second node or indirectly through the repeater (see abstract & paragraphs 0015-0017), comprising the steps of: at the repeater receiving a primary signal and creating a secondary signal as a function of the primary signal and a known distortion, wherein the known distortion identifies the repeater, transmitting the primary signal injected with the secondary signal as the first signal to the primary receiver (paragraphs 0020-0024).

Regarding claim 15, Weissman teaches the communication system is a wireless communication system (see paragraph 0006).

Regarding claim 17, Weissman teaches the second node is a mobile unit (paragraph 0009).

Claim 16 lacks an inventive step under PCT Article 33(3) as being obvious over Weissman (US 2002/0061763).

Regarding claim 16, Weissman fails to specifically disclose the primary receiver is a network analysis system. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the primary receiver as an analysis system because Weissman already teaches the primary station as a base station and therefore it would have been beneficial to do the calculations needed at the base station in order to reduce processing time.

Claim 18 lacks an inventive step under PCT Article 33(3) as being obvious over Weissman (US 2002/0061763).

Regarding claim 18, Weissman fails to specifically disclose the secondary signal is transmitted 9db or less than the primary signal. However, since Weissman teaches injecting distortion to the primary signal, it would have been obvious to have the secondary signal transmitted 9db or less than the primary signal to one of ordinary skill in the art at the time the invention was made to avoid total distortion of the primary signal where recovery would be costly.

Claims 1-13 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a communication system including a primary receiver, a primary transmitter, and a repeater that applies a known distortion to a primary signal passing there-through that identifies the repeater, where the primary receiver receives a first signal from the primary transmitter either directly or via the repeater, and where the first signal includes a primary signal and, if the first signal is received from the repeater, also includes a secondary signal that is a function of the primary signal and the known distortion applied by the repeater, the method of determining if a signal received by the primary receiver is received directly from the primary transmitter or indirectly through the repeater, comprising the steps of: receiving the first signal at the primary receiver; outputting the primary signal from the primary receiver; receiving the first signal at a secondary receiver and obtaining the primary signal from the primary receiver; applying an inverse function to the first signal and the primary signal to retrieve a distortion; and determining whether the first signal has been received from the repeater by comparison of the distortion and known distortions.

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/US05/16453

**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.

Claims 19-34 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a wireless communication system having one or more repeaters, a first node and a second node, a method of determining if a signal received at the first node is received directly from the second node or via one of the one or more repeaters comprising; creating, at the one or more repeaters, a secondary signal  $s'(t)$  that is a function  $f(i, s(t))$  of a primary signal  $s(t)$  received from the second node and a known distortion,  $i$ , applied by the one or more repeaters, where  $i$  is unique for each of the one or more repeaters; injecting the secondary signal  $s'(t)$  into the primary signal  $s(t)$  to form a first signal; transmitting the first signal  $w(t)$  to the first node; detecting at the first node the primary signal  $s(t)$ ; removing the primary signal  $s(t)$  to recover the secondary signal  $s'(t)$ ; determining a distortion from an inverse function  $g(s'(t), s(t))$  of the secondary signal  $s'(t)$  and the primary signal  $s(t)$ , where  $g$  is the inverse of  $f$ ; comparing the distortion  $i$  to the known distortions thereby determining if the signal is received via the one or more repeaters.